Apparel Research Network (ARN) Report Management System (RMS)
RMS Field System for ARN Partner Reporting of Contract Data Requirement List (CDRL) Items

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The Apparel Research Network (ARN) was initiated by the Defense Logistics Agency (DLA) for the purpose of modernizing the ordering, distribution, and manufacturing of military uniforms, and transferring technology from twenty-three companies and universities, the ARN Partners, to the defense apparel manufacturers. ARN Partners, during individual and group efforts, prepare and submit Contract Data Requirements List (CDRL) items to DLA. The CDRLs currently include the Progress Reports, Interim and Final Technical Reports, Schedules, Contract Funds Status Report (CFSR), and several other documents essential to contract performance. The ARN RMS Field System was developed for use by the ARN Partners to initiate and send ARN CDRLs electronically to DLA's Server using electronic data interchange (EDI) and the Internet File Transfer Protocol (FTP). The CDRLs are translated into the ANSI X12 841 Technical Information EDI transaction set. RMS manages the communications session and transmits the ANSI X12 841 via the Internet to DLA where the receiving system performs file management of the CDRLs by ARN Partner, Contract Number, CDRL Number, and Report Sequence Number.

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Apparel Research Network (ARN) Report Management System (RMS)

RMS Field System for ARN Partner Reporting of Contract Data Requirement List (CDRL) Items

The development and implementation of the Apparel Research Network (ARN) Report Management System (RMS) Field System evolved from the critical need of ARN Program Management at the Defense Logistics Agency (DLA) for digital file management of Contract Data Requirements List (CDRL) items and technical documents. The Program Manager receives a large volume of CDRLs that are generated by the twenty-three companies and universities that constitute the ARN Partnership.

During the course of their research and development activities and transfer of technology to the apparel manufacturing industry, the ARN Partners use the RMS Field System to transfer technical documents in the ANSI X12 electronic data interchange (EDI) format using the File Transfer Protocol (FTP) over the Internet.

This report on the RMS Field System was prepared following a logical sequence of events including technology and requirements analysis, system design, software development, software and communications integration, testing and implementation.

Abbreviation / Symbol List

ARN   Apparel Research Network. Network of companies and universities participating in research, development, and technology transfer for the purpose of improving apparel manufacturing in support of DoD requirements.

CDRL   Contract Data Requirements List. Contract deliverables prepared and transmitted by contractors during the performance contract work for the federal government.

EDI   Electronic Data Interchange. The transfer of computer-processable business and technical data between trading partners, computer to computer, in a structured format.

FTP   File Transfer Protocol. Internet application for transfer of files between two parties or computers.

ISP   Internet Service Provider. A company or utility that provides subscribers connectivity to the Internet, and provides services such as FTP, e-mail, and browsing of Internet sites.

RMS   Report Management System. Software application used for the transfer of CDRL items in an EDI transaction set using an EDI translator and Internet FTP.

Table Of Contents

List Of Tables

List Of Figures

1 - Summary

The Report Management System (RMS) Field System provides contractors in the Defense Logistics Agency's (DLA) Apparel Research Network (ARN) the facility to create, send, and receive ANSI X12 841 Technical Information EDI transaction sets that contain the Contract Data Requirements List (CDRLs) or other deliverables required by the ARN contract. The RMS Field System application software was specially configured with the EAGLE EDI Translator system for use in this project. RMS software is included as an application within the EAGLE translator system, and allows the twenty-three ARN Partners' researchers to enter all information required to send CDRLs and other technical documents to DLA. The Internet File Transfer Protocol (FTP) is used to send the ASC X12 841 transaction set data from the research site to DLA and to other ARN Partners. CDRLs are received and stored by the DLA Headquarters RMS Server for contract management purposes, and distribution to the ARN Home Page.

2 - Introduction

A. Subject. The ARN RMS Field System was a Short Term Project (STP) to develop a system to transmit Contract Data Requirements List (CDRL) items to a Server environment at DLA, and to permit the exchange of CDRLs between ARN Partners during the course of the ARN research.

B. Purpose. To investigate the use of electronic data interchange (EDI) and the Internet as a method of transmitting CDRLs and other research documents without distorting or corrupting their format, graphics, and organization.

C. Scope.

1) Assess the technology that could be used to enable reporting of CDRLs, to include computer technology, electronic data interchange (EDI), and word processors.

2) Analyze the ARN Partners' requirements for the sending and receiving of CDRLs.

3) Develop, integrate, test, and implement the RMS Field System and reporting process.

4) Fulfill the objectives of the Defense Logistics Agency's (DLA) ARN Program Office which were to: a) move ARN documents electronically, in a digital format that will make the documents easier to create, to track and to be accessed by researchers; b) exchange documents across different computer platforms without losing any of their native graphics, format, or style; and c) use technology that is independent of software processes, extending the life of the documents beyond the known life of any software product

3 - Assumptions (System Constraints), Methods and Procedures

Assumptions (System Constraints)

The following constraints guided the design and development of the system:

A. A transaction set will contain data for only one contract or delivery order.

B. A transaction set cannot contain CDRL items for two different contracts or delivery orders.

C. A transaction set cannot contain CDRL items for a contract AND a delivery order issued under the contract. The two are independent.

D. A transaction set may contain reports for one or more CDRL items for a single contract or delivery order.

E. All reporting will be as replacement files. The RMS will not accept updates to a previously submitted file. All reporting will come from the latest file. The previously submitted files would be kept for history purposes only.

F. ARN Partners will transmit CDRLs to the DLA Headquarters Server, and to other ARN Partners in the course of contract performance, and during development of the ARN road-map of STPs.

G. CDRLs will be encapsulated in the ANSI X.12 841 Technical Information transaction set and will be transmitted through the Internet.

H. The CDRLs, and application software used for preparation of the CDRLs, are as shown in the following table:

"R"　　　　　= Required Electronically
"AI"　　　　= As Instructed

CDRLs (page 49 of ARN Contract)	Data Item Description (DID)	WINDOWS-COMPATIBLE SOFTWARE (DLA Program Office)	
		Type of Data	Application Software
A001 (R)	Management Master Plan (MMP)	Text: Manpower Loading: Milestone/PERT Chart Spreadsheet: Graphics:	WordPerfect or Word MS Project Lotus MS Powerpoint
A002 (R)	Interim Progress Report (MPR) & Interim Technical Reports (ITR)	Same as A001	Same as A001
A003 (R)	Contract Funds Status Report (CFSR)	Spreadsheet:	Lotus
A004 (R)	Data Accession List	Text	WordPerfect or Word
A005 (R)	Final Technical Report	Same as A001	Same A001; SGML (future)
A006 (AI)	Research & Technology Work Unit Summary (DD Form 1498)	Text	DTIC Software: PCWUIS
A007 (AI)	Report Documentation Page (SF298)	Text; Form	DTIC format; SGML
A008 (AI)	Video Tape Cassette Documentation		
A009 (R)	Presentation Material	Presentations	MS Powerpoint
A010 (R)	Software Development Plan	Same as A001	Same as A001
A011 (R)	Software Requirements Specification	Text, Form	WordPerfect or Word
A012 (R)	Software Users Manual	Same as A001	Same as A001
A013 (R)	Software Systems Development Test and Evaluation Plan	Same as A001	Same as A001
A014 (AI)	Still Photo Coverage		
A015 (R)	Contract Work Breakdown Structure (CWBS)	Work Breakdown	MS Project
D016 (R)	White Paper	Same as A001	Same as A001
D017 (R)	PDQC	Same as A001	Same as A001
D018 (R)	Technical Proposal	Same as A001	Same as A001
D019 (R)	Cost Proposal	Text; spreadsheet	WordPerfect; Word; Lotus
D020 (R)	Business Case	Same as A001	Same as A001

Table 1: Contract CDRLs & Application Software

Method

Assessing Technology. The enabling technology available today to support preparation and transparent transfer of documents from ARN Partners to the designated research data base(s) include:

A. Computer Technology. Microcomputers are available with sufficient power to be used for preparation and transmission of research reports, and generation of EDI transactions with both text and binary information.

B. Electronic Data Interchange (EDI). EDI encompasses the ANSI X12 EDI Standards, EDI Translator Software, and Value Added Networks (VAN) or the Internet. Together they permit the transparent exchange of processable data between computers, data bases and applications at dispersed locations. The Internet was selected by DLA as the method of communications that would be used for the RMS. The ANSI X12 841 Technical Information transaction set was selected by DLA, because it has a binary segment suitable for the transfer of audio, video, graphics, and other complex files and data.

C. Requirements Analysis. The requirements of the reports management system were analyzed and available technology was reviewed prior to development and implementation of the ARN RMS. In the system, as proposed, the ARN Partners prepare ARN CDRLs in native application software such as Word, WordPerfect, MSProject, Lotus, Excel, and Powerpoint. The ANSI X12 841 Technical Information transaction set was data mapped to receive text and binary data contained in ARN CDRLs and other research documents.

D. Systems Development and Integration. The application software was developed in the Microsoft FoxPro data base language. The application software was integrated with the data mapping of the ANSI X12 841 Technical Information transaction set, and with the EAGLE EDI translator. The EAGLE EDI translator contains all the ANSI X12 EDI transaction sets, and the communications external reference (EXREF) for the Internet TCP/IP File Transfer Protocol (FTP). The FTP program and FTP EXREF was prepared with the flexibility to work with any of the Internet Service Providers (ISP) that the ARN Partners might subscribe to for service.

Procedure

System development and implementation was a straight-forward effort of requirements analysis, programming of the application screens, and integration of the application software with the EDI translator, EDI transaction set, and the Internet FTP.

The system was tested by the transmission of CDRL items to the DLA Server. pcAnywhere was included with the RMS application software and the EAGLE EDI translator that was sent to each ARN Partner for installation. With pcAnywhere, EDI Integration Corporation provided on-line assistance and maintenance support to the ARN Partners.

4 - Results and Discussion

Preparation and Control of CDRLs

The RMS application is composed of two primary screens for preparation and control of CDRLs and other research documents, the RMS Main Screen, and the CDRL Screen.

In the RMS Main Screen, Figure 1, information is entered to provide the Sender ID (Cage Code; DUNS Number), the sender's Transaction Serial Number, Contract Number, Delivery Order Number, local Reference Number of the CDRL, and Report and Status Dates. Transmission groups may be set up to identify an individual or organization, or groups of the same who will be the recipients of the EDI FTP transmission.
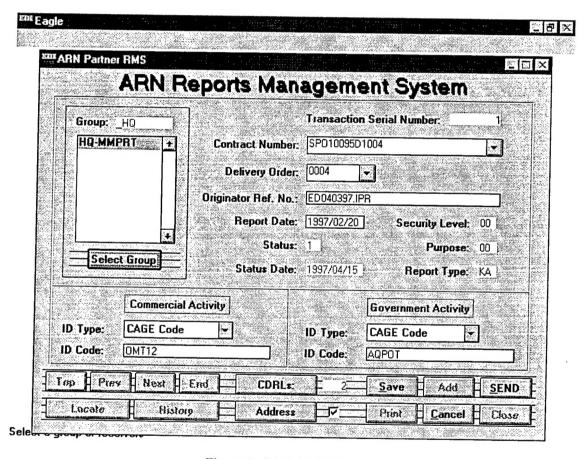

Figure 1 - RMS Main Screen

The screen entry program requires the user to provide an e-mail address, identified as entered by the check-mark next to "Address." The CDRL Screen is accessed from this screen after the user has set the status field to either number "1" or "2" by clicking on the Send button. "1" means that the CDRL is being prepared, and "2" means the CDRL is ready to be sent. Once the status is set to "1" or "2", clicking on the "CDRL" button brings up the CDRL Screen. Each CDRL equates to one Transaction Serial Number. When a CDRL is completed, the user returns to this main screen to initiate another Transaction Serial Number, and then proceeds to create a CDRL for this new Transaction Serial Number. The window to the right of the "CDRL" button shows that there are two CDRLs for Transaction Serial Number 1. "History" and

"Locate" buttons provide the facility for reviewing previous transmissions or finding a transaction that is to be used again or that may need to be sent again.

Creating the CDRL

CDRLs are prepared in native software applications as appropriate or as required by the CDRL description and instructions in the ARN Partners' contracts and delivery orders. The CDRL Screen, Figure 2, provides the application software for setup of the critical data elements and data segments needed by the ANSI X12 841 EDI transaction set to carry the CDRL, and to properly identify the transaction to the DLA Server.
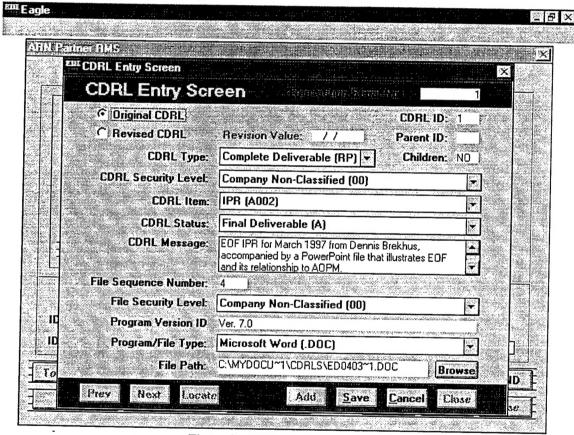

Figure 2 - CDRL Screen

Each CDRL that is created is given a unique "CDRL ID" number (upper right corner) that is linked to the Transaction Serial Number. The screen can be used either to create a CDRL for transmission or for revision of a CDRL that has been identified as needing correction in an e-mail message from the recipient.

The user identifies the CDRL with a "CDRL Item" number from the applicable delivery order or contract, and fills in other identifying information. The actual CDRL is pulled into RMS by browsing for the applicable file using the "File Path" of the software application where the CDRL was created.

6

Transmitting the CDRL

When the CDRL has been completely set up and saved in the RMS Main Screen, Figure 1, the status field must be set to "2", which means "ready to send." The CDRL file is now ready to be converted into the ANSI X12 841 Technical Information EDI transaction set, and is ready to be transmitted the DLA Server or to another ARN Partner.

The conversion and transmission is set in motion by the user selecting "Do All Moves" in the EAGLE EDI translator. Thereafter, the process is completely transparent to the user. The EDI translator retrieves the designated file from the "File Path", converts it to EDI, sets up the Internet FTP communications session, and places the transaction in the file directory of the receiving system. This process is controlled by the Trading Partner Profile tables, and the EXREF Communications table, which have been preset with modem telephone numbers and FTP addresses necessary for establishing connectivity with the DLA Server or an ARN Partner's ISP.

The Transaction Log of the EDI translator shows the transactions that have been sent and provides a view of the EDI transaction. Successful or unsuccessful FTP transmissions are recorded automatically in the Communications Log. The user can quickly review the status of each transmission by accessing these Logs. The "Status" field in the RMS Main Screen, Figure 1, will be automatically set to the number "3" after the transmission is complete.

Discussion

The RMS Field System was developed to minimize the data entry and technical requirements imposed on the user. The system provides a controlled environment for file creation, transmission of files with integrity, and management of CDRLs.

The transmission of CDRLs between ARN Partners over the Internet requires coordination. The factor which makes coordination necessary is the size of the file that is to be sent to the FTP disk space of an ARN Partner. Most Internet Service Providers (ISPs) allocate their subscribers 2 - 5 megabytes of space. The CDRLs that will be exchanged between ARN Partners could in many instances exceed this allocation. ARN Partners must manage this limitation by either splitting up files, subscribing to more FTP disk space, or zipping up files before transmission.

5 - Conclusion

RMS is an inexpensive and effective system for the creation and electronic transmission of CDRL items from ARN Partners (contractors) to DLA and to other ARN Partners, using EDI and the Internet. The system has application in any federal contracting environment that requires contractors to develop and send CDRLs.